

July, 1960

OHIO AGRICULTURAL EXPERIMENT STATION  
Wooster, Ohio

Forestry Department Series No. 45

- - -

The Secrest Experimental Woods

by

John Aughanbaugh

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OHIO AGRICULTURAL EXP. STATION

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The Secrest Experimental Woods in 1931

Continuous and excessive livestock grazing prior to 1931 resulted in the open park condition shown above. A dense understory of dogwood, sassafras, and hophornbeam became established following exclusion of livestock 29 years ago. This woods is now rapidly returning to a productive condition.

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The Secrest Experimental Woods\*  
Experimental Forest No. 14

by

John Aughanbaugh

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Adjacent to the well-known Secrest Arboretum is an intriguing wooded area currently called the Secrest Experimental Woods. Known heretofore as the East Woods or Fry-Taylor woodlot at Ohio's Agricultural Experiment Station, it contains 19 acres of native hardwoods managed intensively since 1947.

The Secrest Experimental Woods features variability of soil moisture, drainage, and exposure, at an elevation of approximately 1,150 feet above sea level. It grows on Wooster silt loam soil derived from glacial till of potentially high productivity that, too, is moderately acid and permeable to its substrata.

The local forest type, classified by ecologists as "oak-hickory", consists mainly of black, red, scarlet and white oaks, hickory, ash, beech, black cherry and black walnut listed in their numerical order of abundance. Scattered associates of sawtimber size include hard and red maple, white and red elm, sassafras, sycamore, butternut, basswood, black locust, black gum and tuliptree. Prominent in the understory are flowering dogwood and hophornbeam.

This tract includes a 7-acre block of young timber that was previously cut over but not grazed. On the remaining 12 acres much of the overstory timber now approaches maturity or is actually overmature. The latter block had been subjected to high-grading and intensive grazing prior to 1931. Tree mortality resulting from the constant grazing gave it a park-like appearance so long as cattle roamed the woodland (cover photo). Later, following 15 years of continuous protection from grazing, its undergrowth had staged a remarkable comeback.

Rehabilitation of the open park portion of this forest has been progressing slowly and with difficulty. Its windswept, sod covered floor and compacted topsoil proved a handicap to early experiments involving seeding, planting, or site preparation<sup>1/</sup>. Dominating the volunteer reproduction have been such weed species

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\*Given at the summer meeting of the Ohio Forestry Association, July 22-23, 1960.

<sup>1/</sup>Restoring forest conditions in an open woods. By Robert R. Paton, Bi-monthly Bulletin, Ohio Agricultural Experiment Station, Vol. 31, No. 238, Jan.-Feb. 1946, pp. 170-176.

as dogwood, sassafras and hophornbeam (Table 1). Many potentially good saplings were throttled by grapevines.

The Secrest Experimental Woods is, therefore, an excellent field laboratory for testing the effectiveness of control measures on inferior species so as to replace them with better young growth. Herbicides such as the mixture of 2,4-D and 2,4,5-T, called "brush killer", have given good results and, when used in conjunction with frequent light improvement cuts, work towards the attainment of our desired objective --- an ideal, all-aged fully-stocked stand.

#### Continuous Inventory

This woodland, one of 28 similar experimental tracts in Ohio, is being managed with the aid of continuous inventory. In essence, it consists of measuring uniformly spaced sample plots whereon the trees are individually numbered. Permanent plot records reveal the full history of forest development (by trees, species, diameter classes, etc.), while recurrent measurements mirror changes in the forest which provide basic guides to silvicultural practice.

During August 1947, forty 1/5th-acre, uniformly spaced sample plots were established in this woods. To date, five different inventories of the growing-stock have been taken. The first inventory showed 5,494 net board feet per acre by International  $\frac{1}{4}$ -inch log scale. The volume harvested from 1947 through the winter of 1952-53 totaled almost 1,500 bd.ft. per acre. This past winter 8,300 additional bd.ft. of usable but low grade material was marked to cut. Nearly 100 cull trees of sawtimber size have been girdled. Because low grade logs serve better for home use than for sale, practically all of the wood products removed have been utilized on the Station farms.

In April 1959 the method of inventory was changed to a 100 percent basis, whereby every tree 7.0 inches and over at breast height ( $4\frac{1}{2}$  feet above ground) is periodically measured and paint-numbered. Permanent reproduction plots, uniformly spaced within the tract, assess the progress of the understory. For the small intensively managed woods, this system tends to simplify our customary inventory techniques.

#### Forest Development

The chart (Fig. 1) depicts the stand's development to the present time. Here is the current distribution by size classes, ranging from poles to over-mature trees: small timber (8 to 12 inches diameter breast high), 28 percent; medium timber (14 to 20 inches), 49 percent; and large timber (22 to 34 inches), 23 percent. By volume, the respective percentages are 6, 39, and 55. Today there are 30.1 sawlog sized trees per acre, having a volume of 5,856 net bd.ft.

Board foot production culminates at 20 inches d.b.h. but is steadily increasing. Between 1947 and 1959 growth and ingrowth together amounted to 178 net bd.ft. per acre yearly. Stocking is sufficient in the 18- to 22-inch diameter classes, but above and below that it still is inadequate. As has been said, the young growth runs heavily to dogwood and hophornbeam, whereas oak, ash, or walnut occur too infrequently. Nevertheless, it is expected that in due time this undesired situation will be corrected.

The Secrest Experimental Woods serves, as do 27 other experimental areas, to demonstrate good on-the-ground timber cropping practices and results to interested woodland owners, sawmill operators, and the wood-consuming public. Moreover, an attractive environment amidst peace and quiet induces people to frequent it for rest, inspiration, or recreation including nature study.

Obviously, the Secrest Experimental Woods must remain for years in an active state of build-up and development. As is true of any managed forest, its silvicultural improvement through sustained cropping depends upon adherence to fundamental principles, to wit:

- (1) To harvest no more than the periodic regrowth, thereby insuring a continuous output of wood products.
- (2) To eliminate or deaden the culls — trees unable to pay their way.
- (3) To cut with regard for future timber crops; hence, above all, to permit the sound trees of highest value to mature.

This, in essence, is true conservation; namely, planned use of the product, wood, a renewable resource, without abuse of the forest capital or growing-stock.

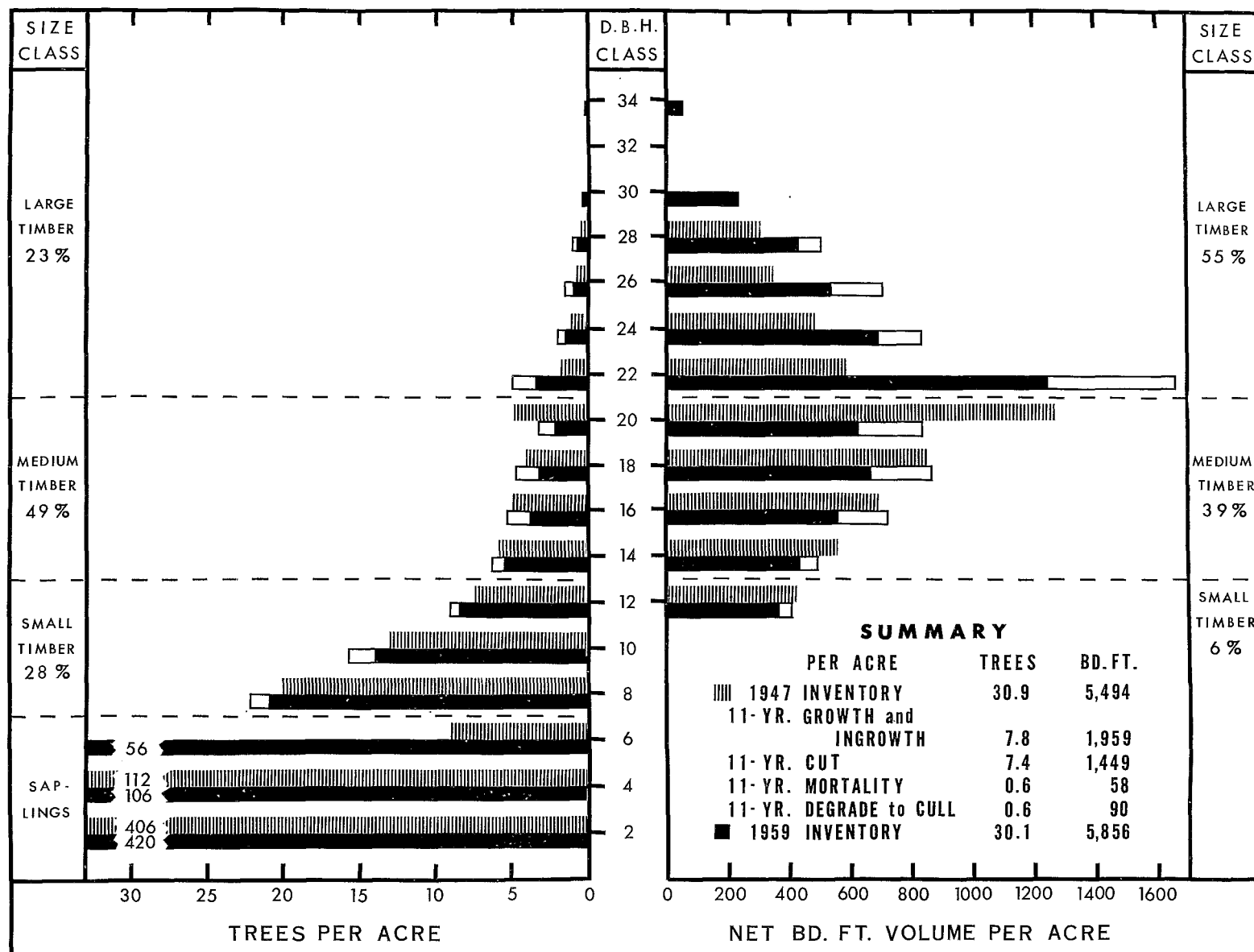
Table 1  
REPRODUCTION IN  
THE SECREST EXPERIMENTAL WOODS  
(Data on per acre basis)

Species	Diameter Class — Inches					
	2"	4"	6"	2"	4"	6"
	Year of Measurement					
	1947			1959		
Black, Red, and Scarlet Oaks	0	0	0	0	0	0
White Oak	31	3	0	7	0	0
Red Maple	3	0	0	30	7	13
White Ash	5	9	0	40	0	13
Beech	11	0	0	30	3	0
Black Cherry	47	22	0	30	13	7
Black Walnut	6	17	0	20	0	3
Hickory <sup>1/</sup>	6	0	3	3	0	0
Red Elm <sup>2/</sup>	22	0	0	0	0	0
Miscellaneous <sup>3/</sup>	275	61	6	260	83	20
Totals	406	112	9	420	106	56

<sup>1/</sup> Shagbark, pignut and bitternut.

<sup>2/</sup> Includes a few American elms.

<sup>3/</sup> Flowering dogwood, hophornbeam, sassafras, black gum, basswood, sugar maple, butternut, sycamore. Species listed in numerical order of abundance.



# GROWING-STOCK IN SECREST EXPERIMENTAL WOODS WOOSTER TOWNSHIP, WAYNE COUNTY, OHIO

1947 - 1959

Figure 1